

WHAT IS CLAIMED IS:

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1. A two/four-wheel drive switching device for a vehicle, comprising:
a switching unit, the switching unit being provided in one of power transfer mechanisms disposed respectively between an engine and front wheels and between the engine and rear wheels to permit and inhibit the transfer of power in the power transfer mechanism in which the switching unit is provided, the switching unit including:

a drive shaft connected to a drive side;

a driven shaft fitted on the drive shaft through an annular clearance;

an odd number of engaging/disengaging members disposed between the drive shaft and the driven shaft for engagement with and disengagement from opposed surfaces of both said shafts to connect and disconnect the shafts;

a switching mechanism for locating the engaging/disengaging members selectively in a position in which the drive shaft and the driven shaft are connected with each other and a position in which both said shafts are disconnected from each other; and

an elastic member which urges the engaging/disengaging members in a direction to connect the drive shaft and the driven shaft with each other,

wherein with rotation of the drive shaft in a two-wheel drive mode, the engaging/disengaging members are moved in a direction to disconnect the drive shaft and the driven shaft from each other.

2. The two/four-wheel drive switching device for a vehicle according to claim 1, wherein said switching member includes a retainer fitted in an outer ring, said retainer being relatively rotatable and movable about the driven shaft and the drive

shaft, a cam formed on a surface of an inner ring for selectively moving the engaging/disengaging members to radially move with a relative movement with the retainer.

3. The two/four-wheel drive switching device for a vehicle according to claim 2, wherein the cam formed on the surface of the inner ring includes nine cam surfaces.

4. The two/four-wheel drive switching device for a vehicle according to claim 2, wherein said elastic member is disposed between the retainer and the inner ring for urging the retainer in a direction opposite to a rotational direction of the drive shaft during a forward travel of the vehicle.

5. The two/four-wheel drive switching device for a vehicle according to claim 4, wherein the elastic member urges the engaging/disengaging members in a direction wherein the outer ring and the inner ring are coupled together.

6. The two/four-wheel drive switching device for a vehicle according to claim 2, wherein said elastic member is C shaped wherein ends of the elastic member are engaged in the rotational direction with the retainer and the inner ring in a compressed condition.

7. The two/four-wheel drive switching device for a vehicle according to claim 2, wherein said switching mechanism includes an electromagnetic clutch for fixing and disconnecting the retainer and the outer ring, said electromagnetic clutch being positioned at an end portion of said outer ring.

8. The two/four-wheel drive switching device for a vehicle according to claim 7, wherein said electromagnetic clutch includes a clutch plate interposed

between the retainer and the outer ring and an electromagnetic coil for engagement and release of the clutch plate.

9. The two/four-wheel drive switching device for a vehicle according to claim 8, wherein in an energized state the electromagnetic clutch engages the clutch plate thereby fixing the retainer and the outer ring to inhibit relative rotation therebetween.

10. A two/four-wheel drive switching device for a vehicle, comprising:

a switching unit operatively mounted in one of power transfer mechanisms disposed respectively between an engine and front wheels and between the engine and rear wheels to permit and inhibit the transfer of power in the power transfer mechanism in which the switching unit is provided, the switching unit including:

a drive shaft connected to a drive side;

a driven shaft fitted on the drive shaft through an annular clearance;

engaging/disengaging means disposed between the drive shaft and the driven shaft for engagement with and disengagement from opposed surfaces of said drive shaft and said driven shaft to connect and disconnect the shafts;

switching means for locating the engaging/disengaging means selectively in a position in which the drive shaft and the driven shaft are connected with each other and a position in which both said shafts are disconnected from each other; and

biasing means for urging the engaging/disengaging means in a direction to connect the drive shaft and the driven shaft with each other,

wherein with rotation of the drive shaft in a two-wheel drive mode, the engaging/disengaging means are moved in a direction to disconnect the drive shaft and the driven shaft from each other.

11. The two/four-wheel drive switching device for a vehicle according to claim 10, wherein said switching means includes a retainer fitted in an outer ring, said retainer being relatively rotatable and movable about the driven shaft and the drive shaft, a cam formed on a surface of an inner ring for selectively moving the engaging/disengaging means to radially move with a relative movement with the retainer.

12. The two/four-wheel drive switching device for a vehicle according to claim 11, wherein the cam formed on the surface of the inner ring includes nine cam surfaces.

13. The two/four-wheel drive switching device for a vehicle according to claim 11, wherein said biasing means is disposed between the retainer and the inner ring for urging the retainer in a direction opposite to a rotational direction of the drive shaft during a forward travel of the vehicle.

14. The two/four-wheel drive switching device for a vehicle according to claim 13, wherein the biasing means urges the engaging/disengaging means in a direction wherein the outer ring and the inner ring are coupled together.

15. The two/four-wheel drive switching device for a vehicle according to claim 11, wherein said biasing means is C shaped wherein ends of the biasing means are engaged in the rotational direction with the retainer and the inner ring in a compressed condition.

16. The two/four-wheel drive switching device for a vehicle according to claim 11, wherein said switching means includes an electromagnetic clutch for fixing and disconnecting the retainer and the outer ring, said electromagnetic clutch being positioned at an end portion of said outer ring.

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17. The two/four-wheel drive switching device for a vehicle according to claim 16, wherein said electromagnetic clutch includes a clutch plate interposed between the retainer and the outer ring and an electromagnetic coil for engagement and release of the clutch plate.

18. The two/four-wheel drive switching device for a vehicle according to claim 17, wherein in an energized state the electromagnetic clutch engages the clutch plate thereby fixing the retainer and the outer ring to inhibit relative rotation therebetween.

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